

Appl. No. 10/787,085

Amendment dated: December 14, 2004

Reply to OA of: October 4, 2004

REMARKS

Applicants have amended the claims to more particularly define the invention and taking into consideration the outstanding Official Action. Claims 23 and 24 have been canceled without prejudice or disclaimer as being present in Applicants' allowed application which will issue as United States Patent 6,830,605 on December 14, 2004.

Applicants acknowledge with appreciation the courtesy of the interview extended Mr. Schlegel, a joint inventor, and the undersigned attorney by Examiner Andrews on October 27, 2004. During this interview the outstanding rejections and the distinguishing features of the claimed invention over the prior art were discussed. The Examiner Summary prepared at the interview indicated that no agreement was reached concerning the allowability of the claims. However, as stated in the Examiner Summary, "Examiner did agree that the abstract did not disclose cermet, grinding and smelting as claimed.

Applicants have carefully considered the rejection of claims 1 and 11 under 35 U.S.C. § 102(b) as being anticipated by Romanian patent no. RO 66833. In rejecting the claims it is urged that the Romanian patent discloses tungsten recovery from scrap cermet which comprises grinding and smelting to produce a composition consisting essentially of ground cermet which is to be smelted. It is also urged that the cited reference therefore anticipates the claimed feedstock of claims 1 and 11. Applicants have carefully considered this rejection but it is most respectfully traversed for the reasons discussed at the interview and below.

Applicants wish to direct the Examiner's attention to MPEP § 2131 which states that to anticipate a claim, the reference must teach every element of the claim.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*,

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868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed Cir. 1989). The elements must be arranged as required by the claim, but this is not an *ipsissimis verbis* test, i.e., identity of terminology is not required. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed.Cir. 1990).

Clearly each element of the claimed subject matter is not found in the Romanian patent as required for a proper anticipation rejection as noted above. Applicants most respectfully submits that the cited reference fails to disclose at least two essential features recited in claim 1 and fails to disclose three recited features of claim 11.

Before discussing the actual deficiencies of the reference relied upon in the rejection which is not the abstract but the Romanian patent, it became evident at the interview that the Official Action that the content of the Romanian patent was determined not on the basis of the teachings of the Romanian patent *per se*, as would be interpreted by one of ordinary skill in the art to which invention pertains but on search document printed at the time of the search performed in this case and well after the effective filing date of this application and is not available as prior art.

The first line of the search document reads, "L7 ANSWER 11 OF 33 HCAPLUS COPYRIGHT 2003 AC". HCAplus is a database and Applicants believe that the very terms relied upon in the retrieved HCAplus document are based on the search parameters of the search request introduced on the basis of Applicants' specification and claims. The HCAplus document does not have an effective date as prior art and is based on Applicants' disclosure. Accordingly, to the extent that this publication is relied upon in the rejection, it should be withdrawn.

Applicants have obtained a copy of the Romanian patent cited by the examiner as well as an English language translation thereof. Enclosed herewith is a copy of the verified English language translation.

Turning now to the rejection of claim 1, Applicants first wish to note that claim 1 requires that the smelter feedstock composition consists essentially of comminuted cermet. Thus, claim 1 includes the limitation that the feedstock composition consists essentially of cermet and further requires that the cermet of the feedstock must be in

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commminated form. Claim 11 is a method claim which also includes the same limitations of claim 1 discussed above and further requires that the method comprises smelting the feedstock in a smelter **which produces a first component containing said metal and a second component which is slag**. In addition claim 11 further requires recovering the metal values from the first component (i.e., the component containing the metal).

As more fully discussed below, Romanian patent no. 66833 does not use a smelting procedure to recover the metal (tungsten) and furthermore the scrap material from which the tungsten is recovered in the cited reference is not cermet. The examiner's attention is directed toward the English language translation of the Romanian patent. It is to be noted from the translation that the method described therein is said to be an improvement over prior art methods for the degradation of wastes containing tungsten. The prior art methods of which the Romanian patent is an improvement are the prior art methods which utilize acid or chlorine to degrade the tungsten waste (see the second through the third paragraphs on page 1 of the translation).

The inventive method of the Romanian patent recovers tungsten from waste material comprising a hard alloy of tungsten (see the last paragraph on page 1 of the translation). The method requires breaking the waste into sizes of 10-100 millimeters and melting of an alkaline oxidant. This results in sodium tungstate which is solubilized by treating it with water at 80-100°C. Metallic tungsten powder is then recovered from the water solution of sodium tungstate. The above process of the Romanian patent is described in the paragraph bridging pages 1 and 2 of the English language translation. It also to be noted from this same paragraph that the waste material from which the tungsten is recovered according to the Romanian patent is tungsten alloy, not cermet. In this regard it is to be noted that it is an alloy which is melted (see the first three lines on page 2 of the translation). In addition, all of the examples refer to alloy as the waste material and all of the method claims for recovering tungsten from waste material refer to the waste material as comprising an alloy. The Romanian patent does not even remotely disclose or suggest the recovery of tungsten from cermet.

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As noted in applicant's specification, it is well known to those skilled in the art that cermet is a composite material which has a ceramic phase and a metallic phase (see page 3, lines 1 and 2 of applicant's specification). It is also noted in applicant's specification that cermets have the unique property which combines the desirable features of ceramics and metals including chemical inertness and electrical conductivity (see page 3, lines 2-4 of applicant's specification). It is this inertness which makes recovery of metal values from the cermet very difficult and different from recovery of metal values from metal alloys which are not part of a cermet material.

Applicants most respectfully submit that the above described distinction between applicants' invention and the Romanian reference is sufficient to overcome the anticipation rejection.

As noted above, Applicants' invention also requires comminution of the cermet material. In contrast, the solubilizing process of the Romanian patent wherein the sodium tungstate compound is solubilized in water, is said to offer an important advantage over prior art methods which use comminution. In particular, it is stated on page 3, lines 10-12 of the English translation that one of the advantages of the invention is that the wastes are used as such, **without prior comminution**. This is a clear teaching away from the required steps of the method of claim 11 and the composition of claim 1.

Applicant submits that the claimed requirement for comminution and the aforementioned avoidance of comminution by the cited reference is sufficient to overcome the anticipation rejection.

Claim 11 is further distinguished over the Romanian reference since claim 11 is a method claim which requires a smelting operation. The Romanian reference fails to disclose any smelting operation whatsoever. In fact, it is noted on page 3, lines 13-16 of the accompanying English language translation that:

The method is simple, consisting of only two operations (melting, and treating with water), and **the resulting solution of sodium tungstate**.

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does not need purification, and allows one to obtain tungsten powder of high purity with the use of classical methods.

In view of the above it is clear that the Romanian patent describes a melting procedure wherein the tungsten alloy scrap is oxidized to a water soluble sodium tungstate which is then dissolved in water as would be appreciated by one of ordinary skill in the art to which the invention pertains. The tungsten is recovered from the water solution. In contrast, Applicants' method of claim 11 uses a smelting procedure in which metal values are recovered from cermet.

The rejection of claims 2, 3, 12, 13, 20, 21, 22 and 24 under 35 U.S.C. § 103(a) as being unpatentable over the above discussed Romanian patent in view of Ray et al. has been carefully considered but is most respectfully traversed.

Applicants wish to direct the Examiner's attention to the basic requirements of a *prima facie* case of obviousness as set forth in the MPEP § 2143. This section states that to establish a *prima facie* case of obviousness, three basic criteria first must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Section 2143.03 states that all claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

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In rejecting the claims the outstanding Official Action urges that the Romanian patent discloses all of the features of the rejected claims except the use of inert anode as the scrap cermet used by the Romanian patent. This statement is most respectfully traversed in view of the above comments concerning the distinctions of the presently claimed invention and the Romanian patent. In particular, the Romanian patent does not disclose the use of cermet as the scrap material and furthermore, does not disclose comminuting the cermet.

As would be appreciated by one of ordinary skill in the art, the Romanian patent specifically teaches that the process described therein is particularly advantageous because comminution is not utilized. This is in clear distinction from the presently claimed invention requiring comminution. Why would one of ordinary skill in the art modify the clear teaching in the reference against comminution? There is no motivation in the prior art and the only such teaching is found in Applicants' specification which may not be used as a teaching reference. *In re Fritch*, 23 USPQ 1780, 1784(Fed Cir. 1992) ("It is impermissible to engage in hindsight reconstruction of the claimed invention, using the applicant's structure as a template and selecting elements from references to fill the gaps.).

Furthermore, as discussed above, the Romanian patent does not utilize cermet as the scrap material and does not employ the smelting procedure. It is clear that in the absence of any disclosure of cermet as the scrap material in the Romanian patent, there would be no motivation to use the anode material described by Ray et al. as the scrap material. Furthermore, even if there were motivation to use the anode material of Ray et al. of the scrap material, using the anode material of Ray et al. in the process of the Romanian patent will not result in applicant's invention in view of the above-discussed distinctions between the Romanian patent and applicant's invention. Accordingly, it is most respectfully requested that this rejection be withdrawn.

Applicants have noted that claims 1-3, 5-13 and 15-24 have been provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 5-8, 11, 15-18, 22 and 24 of copending application

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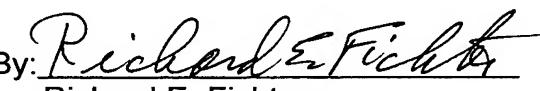
10/387,505 in which the Issue Fee has been paid and which will issue as U.S. Patent No. 6,830,605 on December 14, 2004. In view of the issuance of this application as a patent, Applicants submit herewith the necessary Terminal Disclaimer and required fee thereby obviating an obviousness double patenting rejection of these claims.

It is noted that claims 5-10 and 15-19 have as their only grounds of rejection a provisional type double patenting rejection. These claims are therefore patentable over the prior art of record and now are clearly in condition for allowance.

In view of the above arguments Applicants respectfully request the Examiner to allow all of the currently pending claims.

Respectfully submitted,

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December 14, 2004

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TRANSLATOR'S DECLARATION

I, Stewart L. Colten

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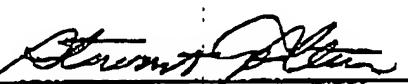
hereby declare:

1. That I know well both the English and Romanian languages;
2. That I translated into English the attached document, written in Romanian (to wit: Romanian Patent 66833, pub. date Aug 29, 1979, inventors Tudor Segarceanu, Margareta Olaru, and Cornelius-Dimitrie Nastasescu, title (translated) "Method and furnace for recovery of tungsten from waste material comprising hard alloys");
3. That the attached English translation is a true and correct translation of the document attached thereto to the best of my knowledge and belief; and
4. That I am aware that any false statement herein or hereconcerning may subject me to punishment by law, and may jeopardize the purposes sought to be effected.

Signed at Arlington, Virginia, this
11th day of December, 2003.

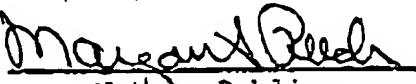
Total of one document.

By:


M.Ch.E., J.D.,
metallurgical engineer,
Member of NCATA

State of Virginia, County of Arlington. ss:

Subscribed and sworn before me this 11th day of Dec,
2003.


Notary Public.

My commission expires

Margaret Reed
NOTARY PUBLIC
Commonwealth of Virginia
My Commission Expires 3/31/06

Sequential number 18053.

Romanian Patent 66833

File number 78206.

Application date: Mar 28, 1976 [?].

Publication date: Aug 29, 1979.

International class (2): C 22 B 34/36 [?].

Inventors/applicants:

Tudor Secarceanu, Margareta Olariu, and
Corneliu-Dimitrie Năstăsescu, all of Romania.

Holder: (in Romanian) Center for research in rare and pure metals,
of Romania.

Title: Method and furnace for recovery of tungsten from
waste material comprising hard alloys.

The present invention relates to a method and a furnace for recovery
of tungsten from waste material comprising hard alloys.

Methods employing acids for degradation of wastes containing tungsten
are known, which employ sulfuric acid, a mixture of nitric and
hydrochloric acids, a mixture of nitric and hydrochloric acids [sic --
redundant], [or] a mixture of nitric and phosphoric acids, wherewith in
all cases prior crushing of the wastes is required, which crushing is a
very difficult operation because of the hardness of the materials.

Also known are methods of degradation employing chlorine or
hypochlorite; these pose problems of corrosion of equipment.

Both the acid methods and the chlorine methods employ expensive
reagents and corrosion-resistant apparatus. A [i.e. another] method of
degradation employing sodium nitrate uses a reagent which is not only
expensive but commercially scarce ("unusual").

The inventive method for recovery of tungsten from waste material
comprising hard alloys consists of breaking up [the waste] into sizes of
10-100 millimeters, melting of an alkaline oxidant, and solubilizing the
sodium tungstate obtained, by treating with water at 80-100 °C, and
separation out of metallic tungsten powder by classical methods; the
method eliminates the [above-mentioned] disadvantages, [and is
characterized,] in that, with the objective of obtaining a high recovery
and simplification of the

-- Col. 2 --

technological process, the alloy is melted along with sodium carbonate and ammonium nitrate, in 100% excess, at approximately 650 °C, for 2 hours. [Translator's note: It is not obvious from the Example below what the proportions of the W, Na₂CO₃, and NH₄NO₃ should be.]

-- The [inventive] furnace [or the like] for carrying out the inventive method is comprised of:

-- a burner for combustive heating, mounted in the interior heating space [of the furnace structure];

-- tilting means, for transferring the melt;

-- a crucible comprised of corrosion-resistant steel (resistant to corrosion by an alkaline melt), for carrying out the melting, which crucible is introduced into the heating chamber;

-- a telescoping hood the position of which can be regulated in the vertical direction depending on the intensity of evolution of gases, until the time [(after completion of the process)] that the crucible is completely sealed.

Hereinafter an exemplary embodiment of the invention will be described, with reference to the Figure. The Figure shows a cross section in a vertical plane of a furnace according to the invention.

10 kg waste comprising hard alloys suitably formed into chips and elongated or tubular pieces with a content of 60 to 90% of titanium carbide, with dimensions 10-100 mm, was introduced [into a furnace crucible], along with a mixture of 16.8 kg ammonium nitrate and 11 kg technical sodium carbonate, under cold conditions [e.g. room temperature], into a tiltable furnace 1 having a crucible 2 comprised of corrosion-resistant steel

-- Col. 3 --

(volume approximately 200 liter), which [crucible] did not have an agitation device [per se] for the molten bath, wherewith [the furnace and crucible were designed to be] heated with a burner 3 fueled by methane gas.

The furnace 1 was heated both by the burner 3 and the reaction which took place in the molten bath, in a manner whereby when at the time that the temperature regime reached 650 °C the gas throughput was reduced.

After the temperature reached 650 °C, within the first 10-15 minutes there was observed an intense liberation of nitrogen-containing vapors which caused bubbling in the molten bath, after which the reaction proceeded calmly until the wastes had been completely degraded. The crucible 2 in which the reaction took place was supported on a U-shaped profile (4a, 4b [sic -- evidently should be just "4a"]) which delimited the combustion chamber 5 of the gases. The [chamber] was lined interiorly with a layer of refractory bricks 6 at the bottom and also had refractory walls 7, and exteriorly had a metal shell 8.

The nitrogen-containing vapors which resulted from the reaction were evacuated through a telescoping hood 9 connected to a ventilator via a

connecting conduit 10. After 2 hours in the regime [of 650 °C temperature], the furnace, which had a tilting system 11, was emptied, wherewith the molten material was poured into ingot molds. During cooling, the molten material became hard and brittle.

The tungsten from wastes which was present in the melt as sodium tungstate could be completely dissolved by treating with water at 80-100 °C. Following filtration, the tungsten could be recovered from the sodium tungstate solution by classical methods, without the need for purification [of the solution]. Any un-degraded wastes were recycled for degradation.

The invention offers the following advantages:

-- the wastes are used as such, without prior comminution, thereby avoiding that difficult and costly operation;

-- Col. 4 --

-- the method is simple, consisting of only two operations (melting, and treating with water), and the resulting solution of sodium tungstate does not need purification, and allows one to obtain tungsten powder of high purity with the use of classical methods;

-- the reagents used are customary, commonly available, and inexpensive.

###

Claims:

1. A method for recovery of tungsten from waste material comprising hard alloys, which method comprises breaking up [the waste] into sizes of 10-100 millimeters, melting of an alkaline oxidant, solubilizing the resulting sodium tungstate by treating with water at 80-100 °C, and separation out of metallic tungsten powder by classical methods; characterized in that, with the objective of obtaining a high recovery, and simplification of the technological process, the alloy is melted along with sodium carbonate and ammonium nitrate, in 100% excess [sic -- excess of exactly what?], at approximately 650 °C, for 2 hours.

2. A furnace for carrying out the method according to claim 1; comprised of:

-- a burner for combustive heating, mounted in the interior heating space; and

-- tilting means, for transferring the melt;

characterized in that [said furnace] is further comprised of:

-- a crucible (2) comprised of corrosion-resistant steel (resistant to corrosion by an alkaline melt), which crucible is introduced into the heating chamber (5);

-- a telescoping hood (9) the position of which hood can be regulated in the vertical direction depending on the intensity of evolution of gases, until such time as the crucible (2) is completely sealed.

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Bibliographic references:

Romanian Patent 66138 (Socialist Republic of Romania).
Russian Patent 179,931 (USSR).

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